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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/511,199	10/12/2004	Yoichi Izumi	43888-341	8650
20277 7590 05/29/2009 MCDERMOTT WILL & EMERY LLP 600 13TH STREET, N.W. WASHINGTON, DC 20005-3096				
EXAMINER				
EICHELMAYER, ALIX ELIZABETH				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

**Application No.**

10/511,199

**Applicant(s)**

IZUMI ET AL.

**Examiner**

Alix Elizabeth Echelmeyer

**Art Unit**

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 24 March 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-5, 8, 9, 12-15 and 17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5, 8, 9, 12-15 and 17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/S508)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Response to Amendment***

1. This Office Action is in response to the amendment filed March 24, 2009. Claims 1 and 17 have been amended. Claim 11 is cancelled. Claims 6, 7, 10, and 16 were previously cancelled. Claims 1-5, 8, 9, 12-15 and 17 are pending and are rejected for the reasons given below.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1, 8, 9, 12, and 17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

It is unclear what is meant by the limitation "apparent thickness." Is the "apparent thickness" and actual thickness, what the thickness appears to be based on the Figures, or another interpretation?

### ***Claim Interpretation***

4. The product-by-process limitations of claims 13 and 15 are not given patentable weight since the courts have held that patentability is based on a product itself, even if the prior art product is made by a different process (see In re Thorpe, 227 USPQ 964,

(CAFC 1985), In re Brown, 173 USPQ 685 (CCPA 1972), and In re Marosi, 218 USPQ 289, 292-293 (CAFC 1983)).

In this case, the structure of the sheet before it was formed or the method by which it was formed is not found to be pertinent to the final structure.

5. The "apparent thickness" limitation of claims 1, 8, 9, 12, and 17 will be interpreted to be the actual thickness of the current collector.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-5, 8, 9, 12-15 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kilb et al. (US 2001/0016282) in view of Yanagihara et al. (US Patent 5,543,250).

Regarding claims 1 and 17, Kilb et al. teach a sealed alkaline nickel/metal hydride storage battery (abstract). The battery is contained in a case having a cup-shaped bottom with a plate that is sealed to the top, as well as electrodes and a separator ([0002]). Since the battery is alkaline, and an electrolyte is necessary for the battery to function, the battery of Kilb et al. would inherently have an alkaline electrolyte.

The pores of the supports would inherently be in communication with each and with the gas transfer path, since the metallic region of the positive electrode is free of active material on the side bearing against the cell ([0006]). Since the porous support allows for the active material to be impregnated, where the active material is not impregnated it would inherently allow for communication between the pores.

Additionally, both electrodes of Kilb et al. contain a conductive support framework made of a porous metal ([0006]).

Kilb et al. teach that recesses in the electrode adjacent the bottom of the case to ensure proper gas exchange ([0022]).

Kilb et al. teach the battery of the instant invention but fail to teach the surface area of the gas transfer path covering the inner face of the bottom of the case or the sealing plate. It would have been obvious to one having ordinary skill in the art at the time the invention was made to determine the most effective surface area of gas transfer since it is important to ensure proper gas exchange in order to prevent trapping of gases and failure of the battery. It has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. MPEP 2144.05 (IIB).

As for claim 5, Kilb et al. teach that the negative electrode is made of a hydrogen storage alloy impregnated into a foam framework ([0016]-[0017]).

Regarding claim 9, Kilb et al. teach that recesses in the outer side of an electrode should be 5-15% of the electrode thickness ([0022]).

As for claims 1 and 17, the support of the electrode is embedded in both the negative and positive electrodes ([0006]).

Kilb et al. fail to teach that the support is punched metal, or contains protrusions.

Yanagihara et al. teach an electrode for a storage battery having punched holes with burrs on their peripheries (abstract, Figure 3).

With regard to claims 1 and 17, Yanagihara et al. teach that the length of the tip ends is 10% or more of the thickness of the current collector plate including the protrusions (column 5 lines 1-25).

Regarding claims 3, 4 and 8, Yanagihara et al. teach that the thickness of the sheet after it is punched is 37.5  $\mu\text{m}$  to 150  $\mu\text{m}$  (column 4 lines 47-49; column 3 line 1).

As for claims 12 and 13, Yanagihara et al. teach a plurality of protrusions in the sheet protruding from either side of the sheet (Figure 3).

Regarding claim 14, Yanagihara et al. teach that a plate having center to center distance between holes of 3.5 mm was previously used, but the punched plate of Yanagihara et al. is better. Still, the pore diameter of 2 mm in the former plate and the plate of Yanagihara et al. is the same, so it would be obvious to make the center to center distance the same to use the plate in the same function (column 4 lines 57-58).

As for claim 15, the structure of the sheet before it was formed does is not considered pertinent since the final structure of the instant application and the final structure of Yanagihara et al. are the same (Figure 3). The plate of Yanagihara et al. has several punched holes (Figure 3).

Yanagihara et al. further teach that the punched plates provide improved adhesion between the plate and the electrode, creating better electrical conductivity

(column 2 lines 20-25). Additionally, the three dimensional thickness of the plate improves the utilization of the active material, creating a higher capacity electrode, preventing voltage drops over large current discharge, and improving cycle life (column 3 lines 25-32).

It would be advantageous to use the punched plates of Yanagihara et al. in the battery of Kilb et al. in order to improve adhesion between the plate and the electrode, create better electrical conductivity, improve the utilization of the active material, create a higher capacity electrode, prevent voltage drops over large current discharge, and improve cycle life.

Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the punched plates of Yanagihara et al. in the battery of Kilb et al. in order to improve adhesion between the plate and the electrode, create better electrical conductivity, improve the utilization of the active material, create a higher capacity electrode, prevent voltage drops over large current discharge, and improve cycle life.

### ***Response to Arguments***

8. Applicant's arguments filed March 24, 2009 have been fully considered but they are not persuasive.

Applicant first argues, on the top of page 7, that Kilb et al. does not teach the claimed length of the tip ends of the protrusions. These limitations are addressed above by the teachings of Yanagihara et al. (see Yanagihara et al. at column 5 lines 1-25).

Next, beginning at the bottom of page 7, Applicant argues that Yanagihara et al. teach away from the disclosure of Kilb et al., and that the instantly claimed invention produces "unexpectedly better results." With regard to Applicant's claim of "unexpectedly better results," also mentioned on the top of page 6, Applicant has provided no evidence of "unexpectedly better" or "unexpectedly superior" results based on Applicant's structure. The examiner acknowledges that the instantly claimed structure is different than that of Kilb et al., but not "unexpectedly better" than the structure of Kilb et al. in view of Yanagihara et al.

Applicant argues on page 8 that Yanagihara et al. teach that the burrs are completely buried in the interior of the electrode. The basis for this argument, evidently, is the disclosure of Yanagihara et al. in Figures 5 and 6, which Applicant alleges to show the use of the current collector of Figure 2 of Yanagihara et al. The examiner disagrees with Applicant's interpretation of the reference: Figure 6 is not disclosed as the same embodiment as Figure 2; in fact, Figures 5 and 6 relate to the embodiment discussed in Example 3 (column 8 lines 15-37), in which the electrode is folded such that the active material (4) is contained within the current collector plates. Such a structure is not taught in the other examples, and is not associated with the plates of Figures 2 and 3.

The examiner strongly disagrees with Applicant's argument that Yanagihara et al. teach away from the invention of Kilb et al. because the examiner disagrees that Yanagihara et al. teach that the current collector is completely buried in the electrode active material.



It is unclear what is meant by Applicant's statement that the results shown in Tables 1 and 2 of Yanagihara et al. indicate that using a substrate punched from both sides is preferable.

In the last sentence of the first full paragraph on page 8, Applicant argues that, if the burrs of the current collector shown in Figure 3 of Yanagihara et al. were not completely buried in the electrode material, then the burrs would penetrate the separator (13, in Figure 7), causing a short. This argument is completely unconvincing since, as discussed above, the battery shown in Figure 7 depicts electrodes of a different embodiment than electrodes containing the current collector of Figure 3.

The examiner holds that one of ordinary skill in the art, in view of the teachings of both Kilb et al. and Yanagihara et al., would be motivated to combine the teachings to arrive at the claimed invention. The combination as laid out in the above rejection does not teach embedding the entire current collector of Kilb et al. in view of Yanagihara et al. with active material, as that would destroy the base reference of Kilb et al. teaching the support being free of active material on the edge adjacent the outer case. The examiner holds that the combination of the current collector of Yanagihara et al. with the battery of Kilb et al. would not result in the current collector being completely embedded in the active material, since it is only the current collector and not the entire electrode of Yanagihara et al. that is being taught in the combination. One cannot show nonobviousness by attacking references individually where the rejections are based on

combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

It appears from the arguments that Applicant also believes that the combination of Kilb et al. and Yanagihara et al. fails to teach that only a certain portion of the tip ends of the protrusions are buried in the electrode active material (see second full paragraph of page 7, bottom of page 9). The examiner finds that the claims contain no limitations as to how deeply the tip ends of the protrusions of the current collector are buried into the electrode active material. The claims require that the tip ends are buried in the electrode, and that the tip ends have a length that is 10% or more of the apparent thickness of the current collector plate.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alix Elizabeth Echelmeyer whose telephone number is (571)272-1101. The examiner can normally be reached on Mon-Fri 8-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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